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GB 2215448 A EP 0323193 A US 4658336 A

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## (54) Improvements to torches

(57) A torch with a plurality of light sources which may be operated electronically to vary the type and intensity of light emitting from it. Such a torch may be housed in a container in which electronics batteries and lamps can be suitably enclosed. Such a container including a transparent or open area to allow light output.

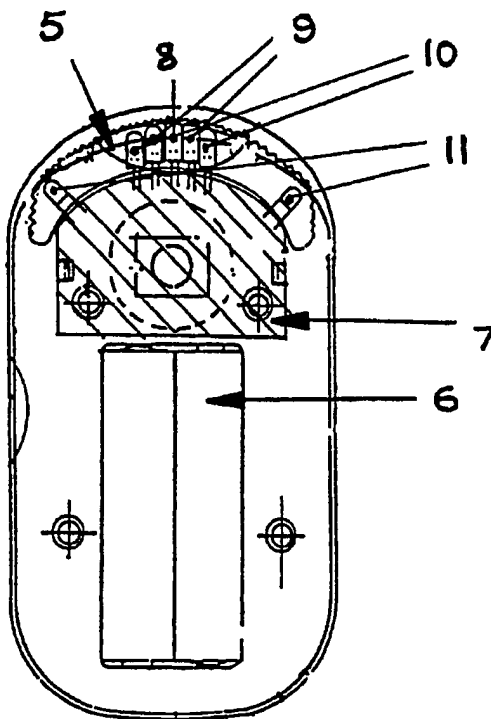


FIG 2



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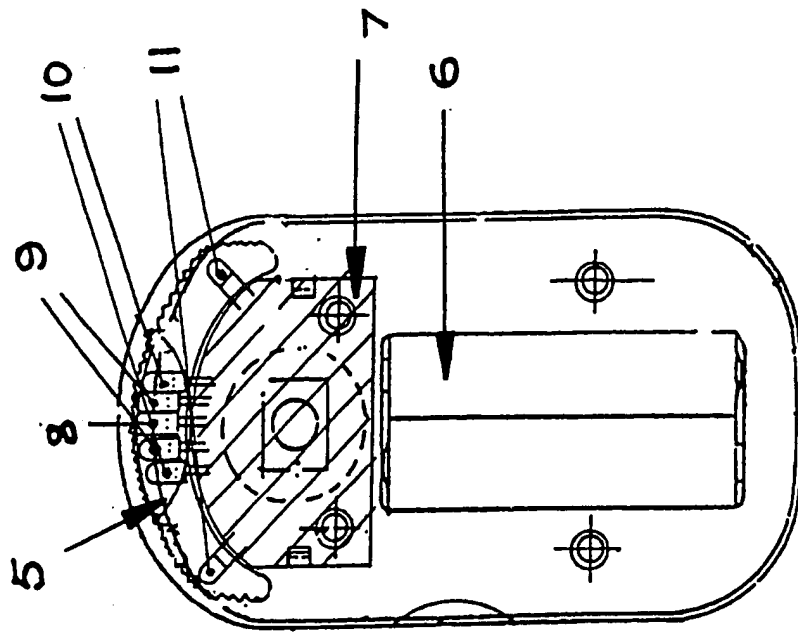


FIG 2

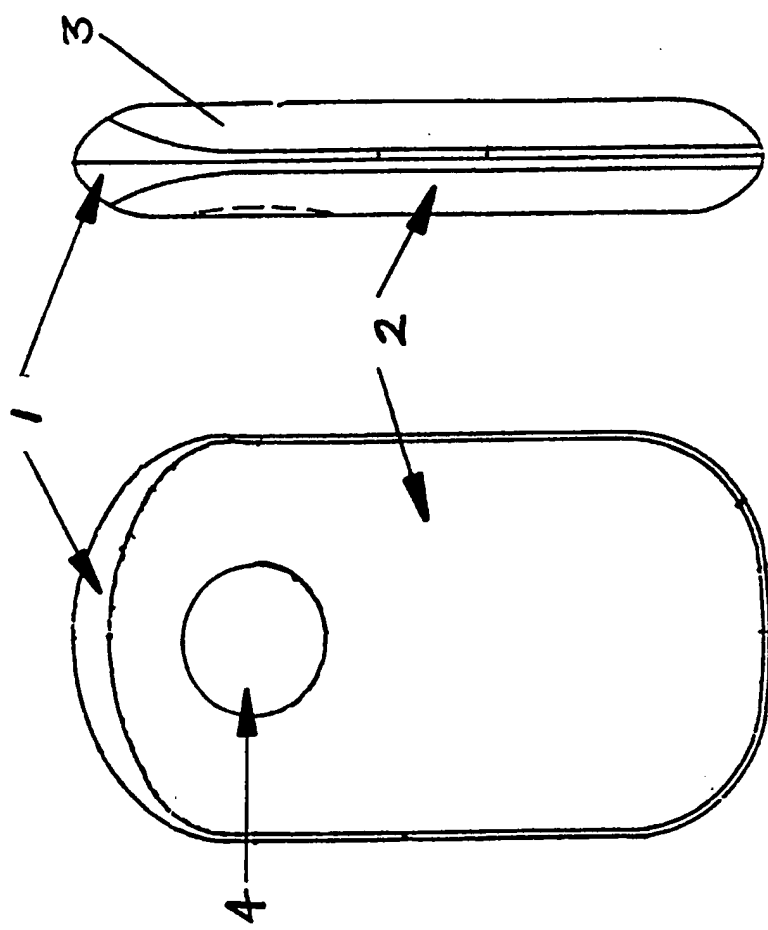
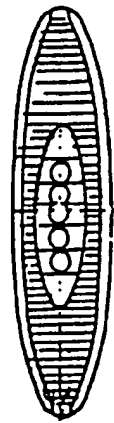


FIG 1



TORCH IMPROVEMENTS

This invention relates to improvements to torches as follows:

Torches normally comprise a battery or batteries and a single light source, that light source being one power level at least until the battery power runs down. This constant power, usually bright, restricts use as there are occasions when a dim light for instance is needed, for discreet or more economical use of the battery.

Torches also normally utilise electrical/mechanical switching which can prove unreliable.

This invention is for a torch with a plurality of light sources which may be used to vary the intensity and type of light emitting from it. The mechanism for this invention may be housed in a rectangular, round or other suitably shaped box with a clear or open area for light to escape. For the purpose of this description (see figures 1 & 2) the torch comprises a smooth, rectangular body comprising two castings, pressings or mouldings (2) and (3) to form respectively front and rear covers in opaque (or clear if desired) material. Batteries, lamps and electronics including switching device and a single chip microcomputer are mounted on a chassis (1) to which (2) and (3) are also attached. This chassis also serves as a transparent lens (incorporating diffusing pattern) to protect lamps and LED's.

This lens/chassis may be viewable from all angles thus enabling, if required light to be visible from any direction of view due to the position of light sources within the body of the torch and/or the use of total internal reflection qualities inherent in the plastic moulding.

A plurality of lamps or light-emitting diodes (LED's) (8,9,10,11) are driven by electronic circuitry and electronic switching which may include a single chip microcomputer (7) and powered by batteries (6). The torch described also incorporates a dimple (4) to aid switching and a reflector (5) to increase efficiency of lamps/LED's.

Figure 1 shows torch casing in plan, front elevation and side elevation. Figure 2 shows front elevation with front panel(2) removed to expose electronics components.

Torch is switched on using, for instance, a push button switch which operates an electronic circuit and provides for example the following order of light output:-

Mode 1 - Off

Mode 2 - Flashing red light using LED's (light-emitting diodes) for example, this mode is very economical of battery life. Torches can be left on in this mode to enable the device to be located easily in a power cut for instance.

Mode 3 - Demonstration. Torch scans through all modes in turn continuously.

Mode 4 - Constant Red Light. Using LED for economical reasons this mode provides discreet light which will not effect pupil dilation (night vision acclimatisation).

Mode 5 - Discreet/Economy 'White' Light. By using a combination of red, green and blue LED's for instance 'white' type light can be produced. This provides a dim light for discreet and economical use which enables user to read more colours (than mode 2). Low powered incandescents will also provide a similiar effect.

Mode 6 - Very bright light is provided by one or more incandescent lamps.

Mode 7 - Emergency/alarm can be visually indicated by flashing lights. These lights can be programmed by microcomputer for instance to emit a pre-determined sequence of intermittance for instance S.O.S on morse code.

Operation procedure may be as follows:-

Press button or key twice in quick succession to switch on (this prevents accidental activation). Torch is now in mode 2, flashing LED. Keep pressing intermittently until required mode is reached. When required mode is reached stop pressing for more than one second and required mode will stay on. To switch off, press again and mode sequence will start again from mode 1 (Note: if intermittent pressing is continued with less than one second intervals torch will scan through modes in turn).

CLAIMS

1) A torch with a plurality of light sources which may be used to vary the intensity and type of light emitting from it.

2) A torch with a single light source which may be varied electronically to emit different levels of light.

3) A torch as in claim (1) using a multi-position switch to operate the plurality of light sources in any combination.

4) A torch as in claim (1) using electronic switching and circuitry to operate light sources in any combination.

5) A torch as in claims (1,4) using electronic switching which prevents accidental activation.

6) A torch as in claim (1,4) which uses a single chip microcomputer to control functions.

7) A torch as in claim (1) incorporating flashing (intermittent) light emitting diodes.

8) A torch as in claim (1) incorporating green and red light emitting diodes together.

9) A torch as in claim (1) incorporating green red and blue light emitting diodes together to produce white light.

10) A torch as in claim (1) incorporating yellow and blue light emitting diodes together to produce white light.

11) A torch as in claims (4,6,7) together with constant (as opposed to intermittent) LED or LED's and one or more incandescent lamps.

12) A torch which enables light to be seen from any angle of view.

13) A torch as in claim (1) which operates in the following sequence:

Press button or key twice in quick succession to switch on (this prevents accidental activation). Torch is now in mode 2, flashing red LED. Keep pressing intermittently until required mode is reached. When required mode is reached stop pressing for more than one second and required mode will stay on. To switch off, press again and mode sequence will start again from mode 1 (Note: if intermittent pressing is continued with less than one second intervals torch will scan through modes in turn).

14) A torch as in claim (1) which operates in the following sequence:

Press button or key twice in quick succession to switch on (this prevents accidental activation). Torch is now in mode 2, flashing LED. Keep key depressed until required mode is reached. When required mode is reached stop pressing for more than one second and required mode will stay on. To switch off, press again and mode sequence will start again from mode 1.

**Patents Act 1977**  
**Examiner's report to the Comptroller under Section 17**  
**(The Search report)**

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**Relevant Technical Fields**

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(ii) Int Cl (Ed.5) F21L 7/00

Search Examiner  
S I AHMAD

Date of completion of Search  
28 JUNE 1994

**Databases (see below)**

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ON-LINE DATABASE: WPI

Documents considered relevant following a search in respect of Claims :-  
1, 3-11, 13 AND 14

**Categories of documents**

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|---|---|
| <b>X:</b> Document indicating lack of novelty or of inventive step.   | <b>P:</b> Document published on or after the declared priority date but before the filing date of the present application.        |
| <b>Y:</b> Document indicating lack of inventive step if combined with one or more other documents of the same category. | <b>E:</b> Patent document published on or after, but with priority date earlier than, the filing date of the present application. |
| <b>A:</b> Document indicating technological background and/or state of the art.   | <b>&amp;:</b> Member of the same patent family; corresponding document.   |

Category	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2215448 A (G D BREAVER)	1, 3
X	EP 323193 A (WAKIMOTO)	1
X	US 4658336 A (MAG-INSTRUMENTS)	1

**Databases:** The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).